

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
18 March 2004 (18.03.2004)

PCT

(10) International Publication Number  
**WO 2004/023060 A1**

- (51) International Patent Classification<sup>7</sup>: **F41H 5/04**
- (21) International Application Number:  
PCT/EP2003/009709
- (22) International Filing Date:  
2 September 2003 (02.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: *6* *MMW 05*  
02020027.5 6 September 2002 (06.09.2002) EP
- (71) Applicant (for all designated States except US): **TELJIN  
TWARON GMBH** [DE/DE]; Kasinostrasse 19-21, 42103  
Wuppertal (DE).
- (72) Inventors; and  
(75) Inventors/Applicants (for US only): **BÖTTGER, Chris-  
tian, Kurt** [DE/DE]; Geschwister Scholl-Strasse 25, 42897  
Remscheid (DE); **HARTERT, Rüdiger** [DE/DE]; Fischer-  
tal 95, 42287 Wuppertal (DE); **STOLZE, Kurt, Rainer**  
[DE/DE]; Astenweg 1, 42799 Leichlingen (DE); **FELS,  
Achim, Gustav** [DE/DE]; Adalbert-Stifter Weg 8, 42109  
Wuppertal (DE).
- (74) Agent: **HEIMANN, Anette**; CPW GmbH, Kasinostrasse  
19-21, 42103 Wuppertal (DE).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,  
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,  
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: **PENETRATION-RESISTANT MATERIAL AND ARTICLES MADE OF THE SAME**

(57) Abstract: A penetration-resistant material is described comprising at least a double layer of woven fabric wherein the double layer comprises a first layer of fabric composed of a first set of threads comprising 3.5 to 20 threads/cm, having a linear density of at least 210 dtex, and comprising at least 65 % of the fabric weight, and a second set of threads comprising 0.5 to 16 threads/cm and having a linear density of at least 50 dtex, with the second set of threads being transverse to the first set of threads, and the ratio of the number of threads/cm of the first set to that of the second set is > 1, and a second layer of fabric composed of a first set of threads comprising 0.5 to 16 threads/cm and having a linear density of at least 50 dtex, and a second set of threads comprising 3.5 to 20 threads/cm, having a linear density of at least 210 dtex, and comprising at least 65 % of the fabric weight, with the second set of threads being transverse to the first set of threads, and the ratio of the number of threads/cm of the second set to that of the first set is > 1, and wherein the first and second sets of threads of the first layer have a parallel orientation towards the first and second sets, respectively, of threads of the second layer, and wherein in the first layer of fabric at least the first set of threads and in the second layer of fabric at least the second set of threads are treated with a water-repellant.

WO 2004/023060 A1